WHAT IS CLAIMED IS:

1. An organic light emitting device comprising an emissive layer disposed between and electrically connected to an anode and a cathode, wherein the emissive layer comprises a host material and a phosphorescent emissive material, and wherein

the host material comprises a compound of the formula VI

$$Y\text{—}[\,X(Ar^1)(Ar^2)(Ar^3)\,]_n \qquad (VI)$$

wherein:

each X is independently selected from Si, Ge, Sn, Pb, Se, Ti, Zr, and Hf;

Y is selected from phenyl, alkyl, cycloalkyl, and a group of the formula

Ar'-A-Ar"

wherein each Ar' and Ar" are independently selected from an aromatic group, and

A is alkyl, cycloalkyl, -O-, or Si(R')(R")

wherein R' and R" are independently selected from phenyl or alkyl;

each Ar^1, Ar^2, and Ar^3 are independently selected from alkyl or an aromatic group; and each Ar^1, Ar^2, and Ar^3 may be independently substituted with one or more of alkyl, alkenyl, alkoxy, phenyl, aralkyl, halogen, NH_2, NHR, NR_2, SiR_3 and CN, and additionally or alternatively, one or more of adjacent Ar^1, Ar^2, Ar^3 may be linked together by a linking group selected from a covalent bond, -O-, $-CH_2-$, -CHR-, $-CR_2-$, -NH- and -NR-;

each R is selected from alkyl, alkenyl, aryl, and aralkyl;

n is an integer between 2 up to the maximum number of sites on Y that can accept a substituent;

wherein the host material has an energy gap of at least 3.2 eV and a triplet energy of at least about 3.0 eV.

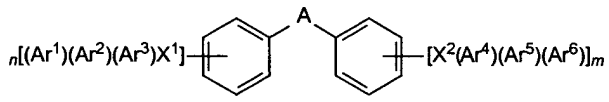
2. The organic light emitting device of claim 1, wherein X^1 and X^2 are both Si.

3. The organic light emitting device of claim 1, wherein each Ar^1, Ar^2, and Ar^3 are independently selected from phenyl or substituted phenyl.

4. The organic light emitting device of claim 1, wherein the phosphorescent emissive material emits in the blue region of the visible spectrum.

5. The organic light emitting device of claim 1, wherein the host material has an energy gap of at least 3.5 eV.

6. An organic light emitting device of claim 1, wherein the host material comprises a compound of the formula VII:



(VII)

wherein:

A is alkyl, cycloalkyl, -O-, or Si(R')(R"),

wherein R' and R" are independently selected from phenyl and alkyl;

each X is independently selected from Si, Ge, Sn, Pb, Se, Ti, Zr, and Hf;

each Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are independently selected from an aromatic group and alkyl group;

each Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 may be independently substituted with one or more of alkyl, alkenyl, alkoxy, phenyl, aralkyl, halogen, NH_2, NHR, NR_2, SiR_3 and CN, and additionally or alternatively, one or more of adjacent Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 may be linked together by a linking group selected from a covalent bond, -O-, $-CH_2-$, -CHR-, $-CR_2-$, -NH- and -NR-;

each R is selected from alkyl, alkenyl, aryl, and aralkyl;

n is an integer between 2 and 5; and

m is an integer between 2 and 5.

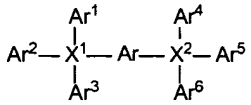
7. The organic light emitting device of claim 6, wherein X^1 and X^2 are both Si.

8. The organic light emitting device of claim 7, wherein each Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are independently selected from an aromatic group.

9. The organic light emitting device of claim 7, wherein each Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are independently selected from a phenyl or substituted phenyl.

10. An organic light emitting device comprising an emissive layer disposed between and electrically connected to an anode and a cathode, wherein the emissive layer comprises a host material and a phosphorescent emissive material, and wherein

the host material comprises a compound of the formula VIII



(VIII)

wherein

X^1 and X^2 are independently selected from Si, Ge, Sn, Pb, Se, Ti, Zr, and Hf;

Ar is phenyl;

Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are independently selected from an aromatic group and an alkyl group;

each of Ar, Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 may be independently substituted with one or more of alkyl, alkenyl, alkoxy, phenyl, aralkyl, halogen, NH_2, NHR, NR_2, SiR_3 and CN;

and additionally or alternatively, one or more of adjacent Ar, Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 may be linked together by a linking group selected from a covalent bond, -O-, $-CH_2-$, -CHR-, $-CR_2-$, -NH- and -NR-; and

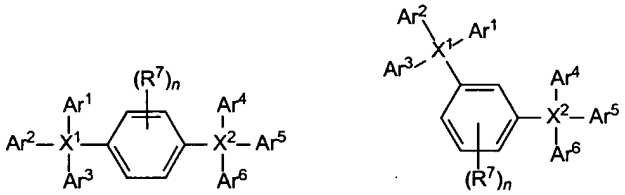
each R is selected from alkyl, alkenyl, aryl, and aralkyl.

11. The organic light emitting device of claim 10, wherein X^1 and X^2 are both Si.

12. The organic light emitting device of claim 10, wherein Ar, Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are independently selected from an aromatic group.

13. The organic light emitting device of claim 12, wherein Ar, Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are phenyl or substituted phenyl.

14. The organic light emitting device of claim 10, wherein the host material is a compound having the formula IX or X:



or

IX X

wherein

X^1 and X^2 are independently selected from Si, Ge, Sn, Pb, Se, Ti, Zr, and Hf;

R^7 is selected from alkyl, alkenyl, alkoxy, aryl, aralkyl, halogen, NH_2, NHR, NR_2 and CN;

n is an integer between 0 and 4;

Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are independently selected from a single ring aromatic group;

each of Ar, Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 may be independently substituted with one or more of alkyl, alkenyl, alkoxy, phenyl, aralkyl, halogen, NH_2, NHR, NR_2, SiR_3 and CN, and additionally or alternatively, one or more of adjacent Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 may be linked together by a linking group selected from a covalent bond,

-O-, $-CH_2-$, -CHR-, $-CR_2-$, -NH- and -NR-; and

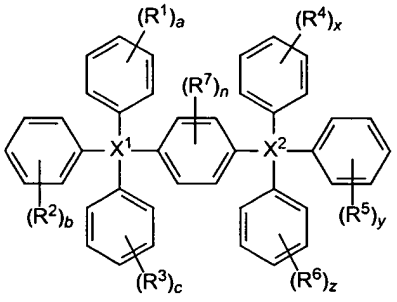
each R is selected from alkyl, alkenyl, aryl, and aralkyl.

15. The organic light emitting device of claim 14, wherein X^1 and X^2 are both Si.

16. The organic light emitting device of claim 14, wherein Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are an aromatic group.

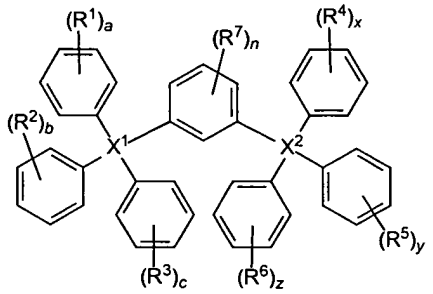
17. The organic light emitting device of claim 16, wherein Ar^1, Ar^2, Ar^3, Ar^4, Ar^5, and Ar^6 are phenyl or substituted phenyl.

18. The organic light emitting device of claim 1, wherein the host material is a compound having the formula XI or a compound of the formula XII:



XI

or



XII

wherein

X^1 and X^2 are independently selected from Si, Ge, Sn, Pb, Se, Ti, Zr, and Hf;

R^1, R^2, R^3, R^4, R^5, R^6, and R^7 are independently selected from alkyl, alkenyl, alkoxy, phenyl, aralkyl, halogen, NH_2, NHR, NR_2 and CN;

n is an integer between 0 and 4;

a is an integer between 0 and 4;

b is an integer between 0 and 4;

c is an integer between 0 and 4;

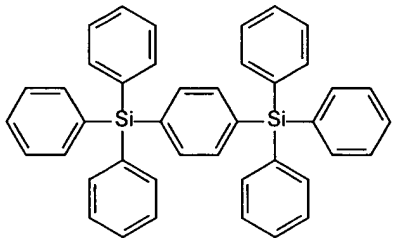
x is an integer between 0 and 4;

y is an integer between 0 and 4; and

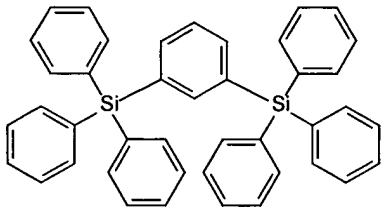
z is an integer between 0 and 4.

19. The organic light emitting device of claim 18, wherein X^1 and X^2 are both Si.

20. The organic light emitting device of claim 18, wherein the host material is a compound having the formula



21. The organic light emitting device of claim 18, wherein the host material is a compound having the formula



22. An organic light emitting device comprising an emissive layer disposed between and electrically connected to an anode and a cathode, wherein the emissive layer comprises a host material and a phosphorescent emissive material, and wherein

the host material comprises a compound of the formula VI_a

$$Y\text{—}[X(Ar^1)(Ar^2)(Ar^3)]_n \qquad (VI_a)$$

wherein:

each X is independently selected from Si, Ge, Sn, Pb, Se, Ti, Zr, and Hf;

Y is selected from phenyl, alkyl, cycloalkyl, or a group of the formula

Ar'-A-Ar"

wherein each Ar' and Ar" are phenyl, and

A is alkyl, cycloalkyl, -O-, or Si(R')(R")

wherein R' and R" are independently selected from phenyl or alkyl;

each Ar^1, Ar^2, and Ar^3 are independently selected from alkyl or a phenyl; and

each Ar^1, Ar^2, and Ar^3 may be independently substituted with one or more of alkyl, alkenyl, alkoxy, phenyl, alkylphenyl, halogen, NH_2, NHR, NR_2, SiR_3 and CN, and additionally or alternatively, one or more of adjacent Ar^1, Ar^2, Ar^3 may be linked together by a linking group selected from a covalent bond, -O-, $-CH_2-$, -CHR-, $-CR_2-$, -NH- and -NR-;

each R is selected from alkyl, alkenyl, phenyl, and alkylphenyl;

n is an integer between 2 up to the maximum number of sites on Y that can accept as a substituent.

23. The organic light emitting device of claim 22, wherein X^1 and X^2 are both Si.

24. The organic light emitting device of claim 22, wherein the phosphorescent emissive material emits in the blue region of the visible spectrum.

25. The organic light emitting device of claim 22, wherein the host material has an energy gap of at least 3.2 eV.

26. The organic light emitting device of claim 22, wherein the host material has an energy gap of at least 3.5 eV.

27. An organic light emitting device comprising

an anode;

a first organic layer which is a charge balancing layer;

a second organic layer which is an emissive layer comprising a host material and a phosphorescent emissive material; and

a cathode

wherein the first organic layer is in physical contact with the second organic layer and is disposed between the anode and the second organic layer or is disposed between the cathode and the second organic layer;

and wherein the host material has an energy gap of at least 3.2 eV.

28. The organic light emitting device of claim 22, wherein the first organic layer is disposed between the hole transport layer and the second organic layer.

29. The organic light emitting device of claim 22, wherein the host material has an energy gap of at least 3.5 eV.

30. The organic light emitting device of claim 22, wherein the first organic layer is an electron blocking layer.

31. The organic light emitting device of claim 22, wherein the first organic layer comprises mCP.

32. The organic light emitting device of claim 22, wherein the phosphorescent emissive material emits in the blue region of the visible spectrum.

33. An organic light emitting device comprising

an anode;

a hole transporting layer;

a charge balancing layer;

an emissive layer comprising a host material and

a phosphorescent emissive material; and

a cathode

wherein

the charge balancing layer is in physical contact with the emissive layer and is disposed between the and the emissive layer and the hole transporting layer; and

the hole mobility of the HTL is at least about three time that of the charge balancing layer.

34. The organic light emitting device of claim 33, wherein the hole mobility of the hole transporting layer is at least about one order of magnitude higher that the charge balancing layer.

35. The organic light emitting device of claim 33,wherein the charge balancing layer is an electron blocking layer.

36. The organic light emitting device of claim 33, wherein the phosphorescent emissive material emits in the blue region of the visible spectrum.

37. The organic light emitting device of claim 33, wherein the host material has an energy gap of at least 3.2 eV.

38. The organic light emitting device of claim 37, wherein the host material has an energy gap of at least 3.5 eV.